

SEQUENCE LISTING

<110> FISCHHOFF, DAVID A.
FUCHS, ROY L.
LAVRIK, PAUL B.
McPHERSON, SYLVIA A.
PERLAK, FREDERICK J.

<120> COLEOPTERAN TOXIN PROTEINS OF BACILLUS THURINGIENSIS

<130> MOBT:195--1

<150> 09/027,998

<151> 1998-02-23

<160> 54

<170> PatentIn version 3.1

<210> 1

<211> 2615

<212> DNA

<213> Artificial Sequence

<220>

<223> Chimeric toxin gene

<400> 1

gagcgactat tataatcata catatTTTTct attggaatga ttaagattcc aatagaatag	60
tgtataaatt atttatcttg aaaggaggga tgcctaaaaa cgaagaacat taaaaacata	120
tatttgcacc gtctaattga tttatgaaaa atcattttat cagtttgaaa attatgtatt	180
atgataagaa agggaggaag aaaaatgaat ccgaacaatc gaagtgaaca tgatacaata	240
aaaactactg aaaataatga ggtgccaaact aaccatgttc aatataccttt agcggaaact	300
ccaaatccaa cactagaaga tttaaattat aaagagtttt taagaatgac tgcagataat	360
aatacggaag cactagatag ctctacaaca aaagatgtca ttcaaaaagg catttccgta	420
gtaggtgatc tcctaggcgt agtaggtttc ccgtttggtg gagcgcttgt ttcgttttat	480
acaaactttt taaatactat ttggccaagt gaagaccctg ggaaggcttt tatggaacaa	540
gtagaagcat tgatggatca gaaaatagct gattatgcaa aaaataaagc tcttgagag	600
ttacagggcc ttcaaaataa tgtcgaagat tatgtgagtg cattgagttc atggcaaaaa	660
aatcctgtga gttcacgaaa tccacatagc caggggaggga taagagagct gttttctcaa	720
gcagaaagtc attttcgtaa ttcaatgcct tcgtttgcaa tttctggata cgaggttcta	780
tttctaacaa catatgcaca agctgccaac acacatttat ttttactaaa agacgtcaa	840
atttatggag aagaatgggg atacgaaaaa gaagatattg ctgaatttta taaaagacaa	900

TOP SECRET

ctaaaactta cgcaagaata tactgaccat tgtgtcaa	at ggtataatgt tggattagat	960
aaattaagag gttcatctta tgaatcttgg gtaaacttta	accgttatcg cagagagatg	1020
acattaacag tattagattt aattgcacta tttccattgt	atgatgttcg gctataccca	1080
aaagaagtta aaaccgaatt aacaagagac gttttaacag	atccaattgt cggagtcaac	1140
aaccttaggg gctatggaac aaccttctct aatatagaaa	attatatctg aaaaccacat	1200
ctatttgact atctgcatag aattcaattt cacacgcggt	tccaaccagg atattatgga	1260
aatgactctt tcaattattg gtccggtaat tatgtttcaa	ctagaccaag cataggatca	1320
aatgatataa tcacatctcc attctatgga aataaatcca	gtgaacctgt acaaaattta	1380
gaatttaatg gagaaaaagt ctatagagcc gtagcaaata	caaactctgc ggtctggccg	1440
tccgctgtat attcaggtgt tacaaaagtg gaatttagcc	aatataatga tcaaacagat	1500
gaagcaagta cacaaacgta cgactcaaaa agaaatgttg	gcgcggtcag ctgggattct	1560
atcgatcaat tgcctccaga aacaacagat gaacctctag	aaaagggata tagccatcaa	1620
ctcaattatg taatgtgctt tttaatgcag ggtagtagag	gaacaatccc agtgtttaact	1680
tggacacata aaagtgtaga cttttttaac atgattgatt	cgaaaaaat tacacaactt	1740
ccgttagtaa aggcataataa gttacaatct ggtgcttccg	ttgtcgcagg tcctagggtt	1800
acaggaggag atatcattca atgcacagaa aatggaagtg	cggcaactat ttacgttaca	1860
ccggatgtgt cgtactctca aaaatatcga gctagaattc	attatgcttc tacatctcag	1920
ataacattta cactcagttt agacggggca ccatttaatc	aatactattt cgataaaacg	1980
ataaataaag gagacacatt aacgtataat tcatttaatt	tagcaagttt cagcacacca	2040
ttcgaattat cagggaataa cttacaaaata ggcgtcacag	gattaagtgc tggagataaa	2100
gtttatatag acaaaattga atttattcca gtgaattaaa	ttaactagaa agtaaagaag	2160
tagtgaccat ctatgatagt aagcaaagga taaaaaatg	agttcataaa atgaataaca	2220
tagtgttctt caactttcgc tttttgaagg tagatgaaga	acactatttt tattttcaaa	2280
atgaaggaag ttttaaatat gtaatcattt aaagggaaca	atgaaagtag gaaataagtc	2340
attatctata acaaaataac catttttata tagccagaaa	tgaattataa tattaatctt	2400
ttctaaattg acgtttttct aaacgttcta tagcttcaag	acgcttagaa tcatcaatat	2460
ttgtatacag agctgttggt tccatcgagt tatgtcccat	ttgattcgct aatagaacaa	2520
gatctttatt ttcgttataa tgattgggtg cataagtatg	gcgtaattta tgagggcttt	2580
tcttttcac	caaaagccaa gtgtatttct ctgta	2615

<210> 2
 <211> 644
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Chimeric toxin

<400> 2

Met Asn Pro Asn Asn Arg Ser Glu His Asp Thr Ile Lys Thr Thr Glu
 1 5 10 15

Asn Asn Glu Val Pro Thr Asn His Val Gln Tyr Pro Leu Ala Glu Thr
 20 25 30

Pro Asn Pro Thr Leu Glu Asp Leu Asn Tyr Lys Glu Phe Leu Arg Met
 35 40 45

Thr Ala Asp Asn Asn Thr Glu Ala Leu Asp Ser Ser Thr Thr Lys Asp
 50 55 60

Val Ile Gln Lys Gly Ile Ser Val Val Gly Asp Leu Leu Gly Val Val
 65 70 75 80

Gly Phe Pro Phe Gly Gly Ala Leu Val Ser Phe Tyr Thr Asn Phe Leu
 85 90 95

Asn Thr Ile Trp Pro Ser Glu Asp Pro Trp Lys Ala Phe Met Glu Gln
 100 105 110

Val Glu Ala Leu Met Asp Gln Lys Ile Ala Asp Tyr Ala Lys Asn Lys
 115 120 125

Ala Leu Ala Glu Leu Gln Gly Leu Gln Asn Asn Val Glu Asp Tyr Val
 130 135 140

Ser Ala Leu Ser Ser Trp Gln Lys Asn Pro Val Ser Ser Arg Asn Pro
 145 150 155 160

His Ser Gln Gly Arg Ile Arg Glu Leu Phe Ser Gln Ala Glu Ser His
 165 170 175

Phe Arg Asn Ser Met Pro Ser Phe Ala Ile Ser Gly Tyr Glu Val Leu
 180 185 190

101100-2694460

Phe Leu Thr Thr Tyr Ala Gln Ala Ala Asn Thr His Leu Phe Leu Leu
195 200 205

Lys Asp Ala Gln Ile Tyr Gly Glu Glu Trp Gly Tyr Glu Lys Glu Asp
210 215 220

Ile Ala Glu Phe Tyr Lys Arg Gln Leu Lys Leu Thr Gln Glu Tyr Thr
225 230 235 240

Asp His Cys Val Lys Trp Tyr Asn Val Gly Leu Asp Lys Leu Arg Gly
245 250 255

Ser Ser Tyr Glu Ser Trp Val Asn Phe Asn Arg Tyr Arg Arg Glu Met
260 265 270

Thr Leu Thr Val Leu Asp Leu Ile Ala Leu Phe Pro Leu Tyr Asp Val
275 280 285

Arg Leu Tyr Pro Lys Glu Val Lys Thr Glu Leu Thr Arg Asp Val Leu
290 295 300

Thr Asp Pro Ile Val Gly Val Asn Asn Leu Arg Gly Tyr Gly Thr Thr
305 310 315 320

Phe Ser Asn Ile Glu Asn Tyr Ile Arg Lys Pro His Leu Phe Asp Tyr
325 330 335

Leu His Arg Ile Gln Phe His Thr Arg Phe Gln Pro Gly Tyr Tyr Gly
340 345 350

Asn Asp Ser Phe Asn Tyr Trp Ser Gly Asn Tyr Val Ser Thr Arg Pro
355 360 365

Ser Ile Gly Ser Asn Asp Ile Ile Thr Ser Pro Phe Tyr Gly Asn Lys
370 375 380

Ser Ser Glu Pro Val Gln Asn Leu Glu Phe Asn Gly Glu Lys Val Tyr
385 390 395 400

Arg Ala Val Ala Asn Thr Asn Leu Ala Val Trp Pro Ser Ala Val Tyr
405 410 415

Ser Gly Val Thr Lys Val Glu Phe Ser Gln Tyr Asn Asp Gln Thr Asp
420 425 430

Glu Ala Ser Thr Gln Thr Tyr Asp Ser Lys Arg Asn Val Gly Ala Val
435 440 445

Ser Trp Asp Ser Ile Asp Gln Leu Pro Pro Glu Thr Thr Asp Glu Pro
450 455 460

Leu Glu Lys Gly Tyr Ser His Gln Leu Asn Tyr Val Met Cys Phe Leu
465 470 475 480

Met Gln Gly Ser Arg Gly Thr Ile Pro Val Leu Thr Trp Thr His Lys
485 490 495

Ser Val Asp Phe Phe Asn Met Ile Asp Ser Lys Lys Ile Thr Gln Leu
500 505 510

Pro Leu Val Lys Ala Tyr Lys Leu Gln Ser Gly Ala Ser Val Val Ala
515 520 525

Gly Pro Arg Phe Thr Gly Gly Asp Ile Ile Gln Cys Thr Glu Asn Gly
530 535 540

Ser Ala Ala Thr Ile Tyr Val Thr Pro Asp Val Ser Tyr Ser Gln Lys
545 550 555 560

Tyr Arg Ala Arg Ile His Tyr Ala Ser Thr Ser Gln Ile Thr Phe Thr
565 570 575

Leu Ser Leu Asp Gly Ala Pro Phe Asn Gln Tyr Tyr Phe Asp Lys Thr
580 585 590

Ile Asn Lys Gly Asp Thr Leu Thr Tyr Asn Ser Phe Asn Leu Ala Ser
595 600 605

Phe Ser Thr Pro Phe Glu Leu Ser Gly Asn Asn Leu Gln Ile Gly Val
610 615 620

Thr Gly Leu Ser Ala Gly Asp Lys Val Tyr Ile Asp Lys Ile Glu Phe
625 630 635 640

Ile Pro Val Asn

<212> PRT
 <213> Bacillus thuringiensis
 <400> 3

Met Asn Pro Asn Asn Arg Ser Glu His Asp Thr Ile Lys Thr Thr
 1 5 10 15

<210> 4
 <211> 45
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Oligonucleotide

<220>
 <221> misc_feature
 <222> (9)..(9)
 <223> N = A, C, G or T

<220>
 <221> misc_feature
 <222> (18)..(18)
 <223> N = A, C, G or T

<220>
 <221> misc_feature
 <222> (21)..(21)
 <223> N = A, C, G or T

<220>
 <221> misc_feature
 <222> (33)..(33)
 <223> N = A, C, G or T

<220>
 <221> misc_feature
 <222> (42)..(42)
 <223> N = A, C, G or T

<220>
 <221> misc_feature
 <222> (45)..(45)
 <223> N = A, C, G or T

<400> 4
 atgaatccna ataatcgntc ngaacatgat acnattaaaa cnacn

<210> 5
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<220>
<221> misc_feature
<222> (9)..(9)
<223> N = A, C, G or T

<220>
<221> misc_feature
<222> (33)..(33)
<223> N = A, C, G or T

<220>
<221> misc_feature
<222> (42)..(42)
<223> N = A, C, G or T

<220>
<221> misc_feature
<222> (45)..(45)
<223> N = A, C, G or T

<400> 5
atgaaccna acaacagaag tgagcagac acnatcaaga cnacn

45

<210> 6
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<220>
<221> misc_feature
<222> (9)..(9)
<223> N = A, C, G or T

<220>
<221> misc_feature
<222> (33)..(33)

TOP SECRET

<223> N = A, C, G or T

<220>

<221> misc_feature

<222> (42)..(42)

<223> N = A, C, G or T

<220>

<221> misc_feature

<222> (45)..(45)

<223> N = A, C, G or T

<400> 6

atgaatccna ataatcggtc cgaacatgat acnataaaaa cnacn

45

<210> 7

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic Oligonucleotide

<220>

<221> misc_feature

<222> (9)..(9)

<223> N = Any nucleotide

<220>

<221> misc_feature

<222> (6)..(6)

<223> Y = C or T

<220>

<221> misc_feature

<222> (12)..(12)

<223> Y = C or T

<220>

<221> misc_feature

<222> (15)..(15)

<223> Y = C or T

<400> 7

atgaayccna ayaaycg

17

T01630-2634553

1. The first part of the document is a letter from the author to the editor, dated 1954. The letter discusses the author's interest in the subject of the book and the author's intention to write a book on the subject. The letter is signed by the author, and the date is given as 1954.

45

<210> 10
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 10
aaataaagat ctggctagct acctactaaa cactgggatt gttcc

45

<210> 11
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric toxin

<400> 11
Gly Thr Ile Pro Val Phe Ser Arg Leu Ala Arg Ser Leu Phe
1 5 10

<210> 12
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 12
ttacaggcgg agattagtag gtagctagcc agatctttat tttc

44

<210> 13
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 13
gaaaataaag atctggctag ctacctacta atctccgcct gtaa

44

<210> 14
<211> 12
<212> PRT
<213> Artificial Sequence

034450-263450

<220>
<223> Chimeric toxin

<400> 14

Thr Gly Gly Asp Val Ala Ser Gln Ile Phe Ile Phe
1 5 10

<210> 15
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 15
ctcagtttag acggggctag taggtagcta gccagatctt tattt

45

<210> 16
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 16
aaataaagat ctggctagct acctactagc cccgtctaaa ctgag

45

<210> 17
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric toxin

<400> 17

Leu Ser Leu Asp Gly Ala Ser Arg Leu Ala Arg Ser Leu Phe
1 5 10

<210> 18
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

101630-2594550

<400> 18
gtttatatag acaaaattga atttagtagg tagctagcca gatctttatt tt 52

<210> 19
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 19
aaaataaaga tctggctagc tacctactaa attcaatttt gtctatataa ac 52

<210> 20
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric toxin

<400> 20
Val Tyr Ile Asp Lys Ile Glu Phe Ser Arg Leu Ala Arg Ser Leu Phe
1 5 10 15

<210> 21
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 21
tataaagagt ttttaagaat aactgcagat aataata 37

<210> 22
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 22
tattattatc tgcagttatt cttaaaaact ctttata 37

<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 27
ccatgctagg agtagtaggt ttcccgtttg tggagcgctt g 41

<210> 28
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 28
caagcgctcc acaaacggga aacctactac tcctagcatg g 41

<210> 29
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric toxin

<400> 29
Met Leu Gly Val Val Gly Phe Pro Phe Val Glu Arg Leu
1 5 10

<210> 30
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

<400> 30
ccatggcaat ttggccaagt gaagac 26

<210> 31
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Chimeric toxin gene

TOP SECRET

<400> 31
gtcttcactt ggccaaattg ccatgg

26

<210> 32
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric toxin

<400> 32

Met Ala Ile Trp Pro Ser Glu Asp
1 5

<210> 33
<211> 661
<212> DNA
<213> Artificial Sequence

<220>
<223> Recombinant Cauliflower Mosaic Viral Promoter (CaMV35S)

<400> 33
aagcttgcag gctgcaggt ccgatgtgag acttttcaac aaagggtaat atccggaaac 60
ctcctcggat tccattgccc agctatctgt cactttattg tgaagatagt ggaaaaggaa 120
ggtggtcctt acaaatgcca tcattgcgat aaaggaaagg ccatcgttga agatgcctct 180
gccgacagtg gtcccaaaga tggaccccca cccacgagga gcacgttgga aaaagaagac 240
gttccaacca cgtcttcaaa gcaagtggat tgatgtgatg gtccgatgtg agacttttca 300
acaaagggtg atatccggaa acctcctcgg attccattgc ccagctatct gtcactttat 360
tgtgaagata gtggaaaagg aaggtggctc ctacaaatgc catcattgcg ataaaggaaa 420
ggccatcgtt gaagatgcct ctgccgacag tgggtcccaa gatggacccc caccacgag 480
gagcatcgtg gaaaaagaag acgttccaac cagctcttca aagcaagtgg attgatgtga 540
tatctccact gacgtaaggg atgacgcaca atcccactat ccttcgcaag acccttcctc 600
tatataagga agttcatttc atttgagag gacacgctga caagctgact ctagcagatc 660
t 661

<210> 34
<211> 19
<212> PRT

<213> Bacillus thuringiensis

<220>

<221> MISC_FEATURE

<222> (2)..(2)

<223> Xaa = Any

<220>

<221> MISC_FEATURE

<222> (4)..(4)

<223> Xaa = Any

<400> 34

Met Xaa Pro Xaa Thr Arg Ala Leu Asp Asp Thr Ile Lys Lys Asp Val
1 5 10 15

Ile Gln Lys

<210> 35

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic Oligonucleotide

<400> 35

tgaacatggt tagttgg

17

<210> 36

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic Oligonucleotide

<400> 36

taggtgatct ctaggcg

17

<210> 37

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic Oligonucleotide

TOP SECRET

<400> 37
ggaacaacct tctctaatat

20

<210> 38
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<220>
<221> misc_feature
<222> (6)..(6)
<223> Y = C or T

<220>
<221> misc_feature
<222> (12)..(12)
<223> Y = C or T

<220>
<221> misc_feature
<222> (9)..(9)
<223> N = A, C, G or T

<220>
<221> misc_feature
<222> (15)..(15)
<223> Y = C or T

<400> 38
atgaayccna ayaaycg

17

<210> 39
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<220>
<221> misc_feature
<222> (6)..(6)
<223> Y = C or T

FOR EBI-2594660

<220>
 <221> misc_feature
 <222> (3)..(3)
 <223> R = A or G

<220>
 <221> misc_feature
 <222> (15)..(15)
 <223> H = A, C, or T

<220>
 <221> misc_feature
 <222> (9)..(9)
 <223> Y = C or T

<220>
 <221> misc_feature
 <222> (12)..(12)
 <223> Y = C or T

<400> 39
 garcaygaya cyathaa

17

<210> 40
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Oligonucleotide

<400> 40
 gattgttcgg atccatgggtt cttcctccct

30

<210> 41
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Oligonucleotide

<400> 41
 tagtaggtag ctagcca

17

<210> 42
 <211> 21

TOP SECRET

<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<400> 42
gatctggcta gctacctact a 21

<210> 43
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<400> 43
cgtattatta tctgcatcca tggttcttcc tccct 35

<210> 44
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<400> 44
attattatct gcagttattc ttaaaaaactc tttat 35

<210> 45
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<400> 45
tcacttggcc aaattgccat ggtatttaaa aagtttgt 38

<210> 46
<211> 60
<212> DNA
<213> Bacillus thuringiensis

<400> 46
atgataagaa agggaggaag aaaaatgaat ccgaacaatc gaagtgaaca tgatacaata 60

<210> 47

<211> 12
 <212> PRT
 <213> Bacillus thuringiensis
 <400> 47

Met Asn Pro Asn Asn Arg Ser Glu His Asp Thr Ile
 1 5 10

<210> 48
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Oligonucleotide

<400> 48
 cggattcatt ttagatcttc ctccctt 27

<210> 49
 <211> 60
 <212> DNA
 <213> Bacillus thuringiensis
 <400> 49
 gtttatatag acaaaattga atttattcca gtgaattaaa ttaactagaa agtaaagaag 60

<210> 50
 <211> 12
 <212> PRT
 <213> Bacillus thuringiensis
 <400> 50

Val Tyr Ile Asp Lys Ile Glu Phe Ile Pro Val Asn
 1 5 10

<210> 51
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic Oligonucleotide

<400> 51
 ctttctagtt aaagatcttt aattcactg 29

<210> 52
 <211> 60
 <212> DNA
 <213> Bacillus thuringiensis
 <400> 52
 ccaaaccac cactagaaga tttaaattat aaagagtttt taagaatgac tgcagataat 60

Top 50-654560

<210> 53
<211> 20
<212> PRT
<213> Bacillus thuringiensis
<400> 53

Pro Asn Pro Thr Leu Glu Asp Leu Asn Tyr Lys Glu Phe Leu Arg Met
1 5 10 15

Thr Ala Asp Asn
20

<210> 54
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Oligonucleotide

<400> 54
atctgcagtc attgtagatc tctctttata attt

34

TOF80-2634660